

REMARKS

Claims 1-3 and 5-26 are pending in the present application. Claims 1-3, 5, 6, 8, 9 and 12-16 are rejected. Claim 6 is herein amended.

Claim Objections

Claim 6 is objected to because the claim should read, “said **low** carrier concentration layer” instead of “said **lower** carrier concentration layer”. Applicants herewith include this amendment to claim 6.

Claim Rejections under 35 U.S.C. §103

Claims 1-6, 8, 9, 12-16 rejected under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 6,181,723 to Okubo et al. in view of U.S. Patent No. 5,963,572 to Hiroyama et al.

The Examiner concludes that it would have been obvious to use a thickness of .003 μm or 0.1 μm in the device of Okubo et al., since Hiroyama et al. discloses a similar layer from the III-V group compound in a similar structural arrangement and composition, which the Examiner asserts will provide a similar function within the device.

Applicants respectfully disagree with the above rejection, because not all of the claimed limitations are fairly taught or suggested by the cited reference. Further, even if the limitations were suggested, ample evidence exists in the specification to show unexpected results associated with the use of the claimed amounts of the claimed substances.

In regard to the claim rejection under 35 U.S.C. §103, the Examiner asserts the unpatentability of the present invention by indicating that although Okubo et al. fails to describe that the layer (956) corresponding to the depletion enhancement layer is at least 10 nm, the semiconductor layer (8) of 0.1 μm in thickness shown in Fig. 1 of Hiroyama et al. corresponds to the layer (956) of Okubo et al. corresponding to the depletion enhancement layer.

However, Applicants note that although the layer (956) of Okubo et al. corresponding to the depletion enhancement layer is regarded as “the layer between the first cladding layer and the current blocking layer” claimed in the present invention, the semiconductor layer (8) of Hiroyama et al. is such a layer as to be provided on a ridge portion 7b of the cladding layer, i.e., a current injection region, and is thus totally different from “the layer between the first cladding layer and the current blocking layer.”

In other words, even if the semiconductor layer (8) of at least 10 nm in thickness is described in Hiroyama et al., this semiconductor layer (8) is completely different from “the layer between the first cladding layer and the current blocking layer,” and one skilled in the art at the time of the invention would not have inferred from Hiroyama et al. either that the layer (956) of Okubo et al. corresponding to the depletion enhancement layer is set to have a thickness of at least 10 nm nor that the depletion enhancement layer of the present invention is set to have a thickness of at least 10 nm.

Applicants note that in the device shown in Fig. 22 of Okubo et al., an etch stop layer 956 has a thickness of 3 nm, which would not equal the same function as the depletion enhancement layer having thickness of at least 10 nm, of the present invention. Applicants note that the claimed thickness of the depletion enhancement layer of the present invention results in significant

improvements in cut-off frequency and high-frequency characteristics. Data that indicates that unexpected results occur from the use of the specifically claimed amounts of the depletion enhancement layer. Applicants specifically note Figs 6, 8 and 9 in the drawings filed concurrently with the present application. Figures 6, 8 and 9 show the relation between a cutoff frequency and the thickness of the depletion enhancement layer in semiconductor laser devices of the present invention. Unexpectedly undesirable results are clearly shown for thicknesses below 10 nm. If one were so inclined to prepare such a layer in the range of 3 nm, one would not obtain or learn about the unexpectedly superior results associated with the layer thickness of 10 nm or greater.

For the above reasons, Applicant submit that the present invention would have been obvious over the cited references. In view of the aforementioned amendments and accompanying remarks, Applicants submit that the claims, as amended, are in condition for allowance. Applicants request such action at an early date.

If the Examiner believes that this application is not now in condition for allowance, the Examiner is requested to contact Applicants' undersigned attorney at the telephone number indicated below to arrange for an interview to expedite the disposition of this case.

U.S. Patent Application Serial No. 09/746,065

In the event that this paper is not timely filed, Applicants respectfully petition for an appropriate extension of time. Please charge any fees for such an extension of time and any other fees that may be due with respect to this paper to Deposit Account No. 01-2340.

Respectfully submitted,

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Enclosure: Version with Markings to Show Changes Made



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VERSION WITH MARKINGS TO SHOW CHANGES MADE

IN THE CLAIMS:

Please amend claim 6 as follows:

6. **(Amended)** The semiconductor laser device according to claim 1, further comprising a ridge-shaped second cladding layer of a first conduction type provided on said depletion enhancement layer in said current injection region, wherein
said depletion enhancement layer is formed on said first cladding layer, and
said ~~lower~~ low carrier concentration layer and said current blocking layer are successively formed on said depletion enhancement layer located on both sides of said second cladding layer and on the side surfaces of said second cladding layer.